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The impact of Euro 2012 on employment and wages in Poland

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1. Introduction

This study, as one of the few concerned with the Polish circumstances, is intended to determine what significance should be attributed to stage the Euro 2012 in Polish host cities. The study contains an attempt to determine the impact of Euro 2012 on the labour market in Poland, specifically on the employment and wages. For this purpose the differences-in-differences model was applied, investigating the changes in employment and real wages in the voivodeships where the tournament matches were played compared to the other voivodeships. Strong emphasis was placed on analysing the situation at the end of the event to enable determination of the legacy of Euro 2012. Despite the relatively short period that elapsed since the end of the event it is hoped that the study will show the anticipated trends. Nevertheless, in more distant future it will be worth returning to the attempts to determine the impact by *ex post* analysis, not only on the labour market but also on other areas indicated in this study, to obtain the full picture of the effect exerted on Polish cities by this mega sports event.

2. The research methodology

This chapter focuses on an attempt to determine the impact of the UEFA European Championships on employment and wages in the four host cities. It is the first *ex post* study in Poland concerned with the degree of impact of Euro 2012 in terms of changes both in employment and wages.

The view commonly expressed in world literature is that the impact of a sports event on the labour market should be investigated by determining the

level of divergence between the case “with the event” and the case “without the event”, i.e. by establishing how far the employment or wage rates after the event may differ from the hypothetical situation of the event not having been held [Ahmar, 2008, p. 14]. The individual researchers have adopted various approaches to that issue, employing different methods of measurement, estimating different values characteristic of the labour market (e.g. by choosing specific employment sectors or analysing the labour market in a general manner for the economy of a city/region/country) and also assuming different time frames (before, during or after the event). Despite this variety, the most commonly used methods include the differences-in-differences method used, *inter alia*, by Hotchkiss et al [Hotchkiss et al., 2003, pp. 691–704] and econometric equations, utilised e.g. by Baade and Matheson [Baade, Matheson, 2000, pp. 35–46].

A similar approach was adopted in this case, where the Author decided to carry out the research based on the advanced difference-in-difference method (DD). Its advanced character involves a multidimensional approach to the effect of an event on the labour market, i.e. by isolating selected sectors of the economy, analysis in the entire preparation period as well as following the event, and investigating the trends describing the present and future direction of changes.

The statistical data used in this study were sourced from the Local Data Bank presented on the government website: www.stat.gov.pl. They refer to the employment and average wage levels. Since the statistical data apply, at best, to the voivodeship level (NUTS 2), rather than the individual city level (NUTS 4) the decision was made to carry out the research in a somewhat wider context than initially planned, namely, with respect to the four voivodeships: Dolnośląskie, Mazowieckie, Pomorskie i Wielkopolskie. Following an analysis of quantities related to employment and wages, the decision was made to isolate several sectors of the economy presented as PKD 2007 (Polish Classification of Activity) sections where, in the Author's opinion, the impact of Euro 2012 hosting may have been the most significant. These sectors include construction, trade, accommodation and food services and real estate market services. It is worth emphasising that the sectors selected apply to employees of enterprises rather than public sector workers, on whom the organisation of Euro 2012 had a very limited impact, in the Author's opinion.

The average employment and average monthly wage data within the PKD 2007 sections apply to the entities of the enterprise sector with more than 9 employees. The data refer to persons employed under a contract of employment, full time and part time, as full-time equivalent. The remuneration data refer to the gross wage, i.e. inclusive of advance personal income tax payments and statutory social insurance (pension, disability and sickness insurance) contributions paid by the insured employee.

The time frame of the observation extends over 30 quarters, starting in 2006, i.e. less than a year and a half before the formal selection of Poland as a Championships host and concluding after the second quarter of 2013, which was the last possible moment for which statistical data were available at the time of preparation of this study. Commencing the labour market analysis 6.5 years before the event seems quite sufficient in view of the fact that in the first quarter of 2006 it was not yet known that Poland would be the event host. Certain doubts are raised by the research following the event, which cover only 4 quarters, but it is the Author's belief that such a period is sufficient to determine short-term changes *ex post*. Nevertheless, it would be worthwhile to extend this analysis by further quarters in the future, to investigate the medium- and long-term effect of the event on the labour market, including wages in selected voivodeships.

Application of the differences-in-differences method involved a comparison of variables analysed in four voivodships with the quantities for the remaining twelve Polish voivodships, which were assumed not to have experienced the Euro effect. It was also assumed that the employment and wage changes in the four voivodships affected by Euro 2012 would have been the same as in the remaining voivodeships had the UEFA Euro not been held in their territory. However, it should be kept in mind that, according to some researchers, organisation of a mega sports event in one region also exerts an impact on the neighbouring ones [Baumann, 2011, p. 7]. In the case of Euro 2012 it supposedly might have been the case with respect to Cracow or, more broadly, the Małopolskie Voivodeship, as discussed in chapter 5.1 concerning the tourist traffic generated by the organisation of Euro 2012. Nevertheless, this fact has not been taken into consideration in the research into the labour market and wages conducted as part of this study.

3. Comparison of average employment and wage levels in the Euro 2012 host voivodeships and other regions

Figures 6.1 and 6.2 present a comparison of the average employment and average wage level, respectively, in the four voivodeships where Euro 2012 was held (match venues) and the remaining twelve voivodeships (others). The dynamics of changes was analysed for the successive quarters in the period 2006–2013 with the 1st quarter of 2006 assigned the value of 100.

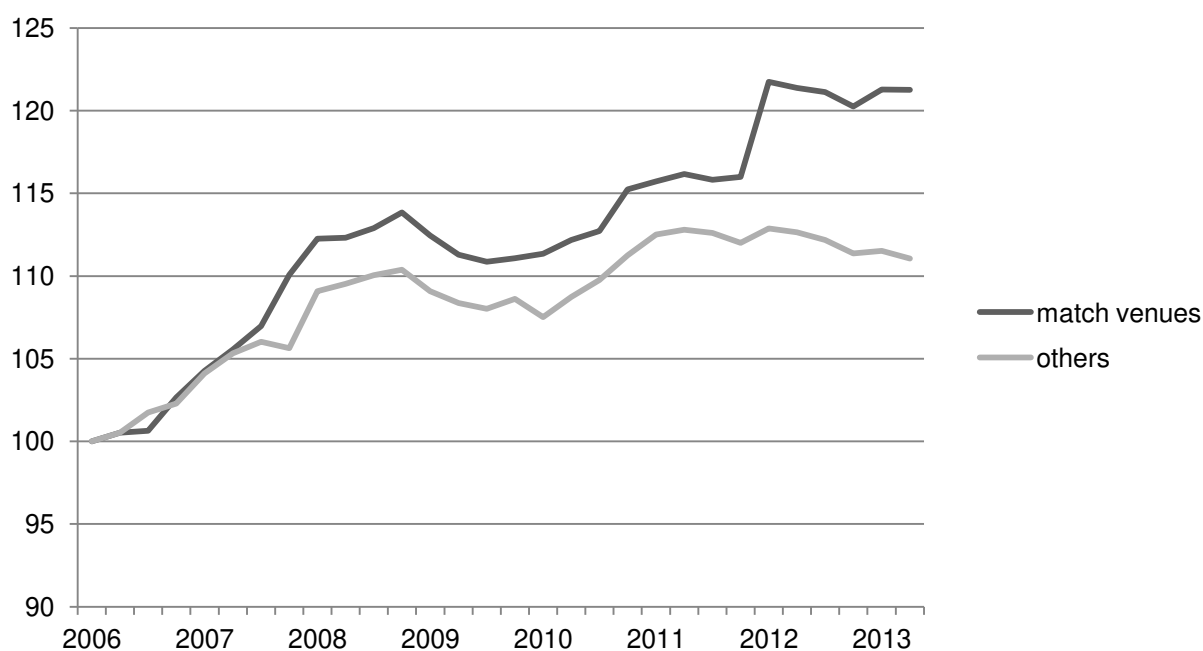


Figure 6.1. Comparison of the average employment in the private sector in Euro 2012 match venues and other voivodeships (the year 2006 = 100)

Source: Author's own compilation based on: Local Data Bank, Central Statistical Office, <http://www.stat.gov.pl>.

In the case of average employment, there is a general upward trend both in the case of match venues and others. While the dynamics of changes was nearly the same in both groups until 2007, there is a marked difference from then on in favour of the voivodeships hosting the tournament. Relatively small to start with, the difference increases until the last quarter of 2011 and until mid-2013 it remains at a high level estimated at 10 percentage points.

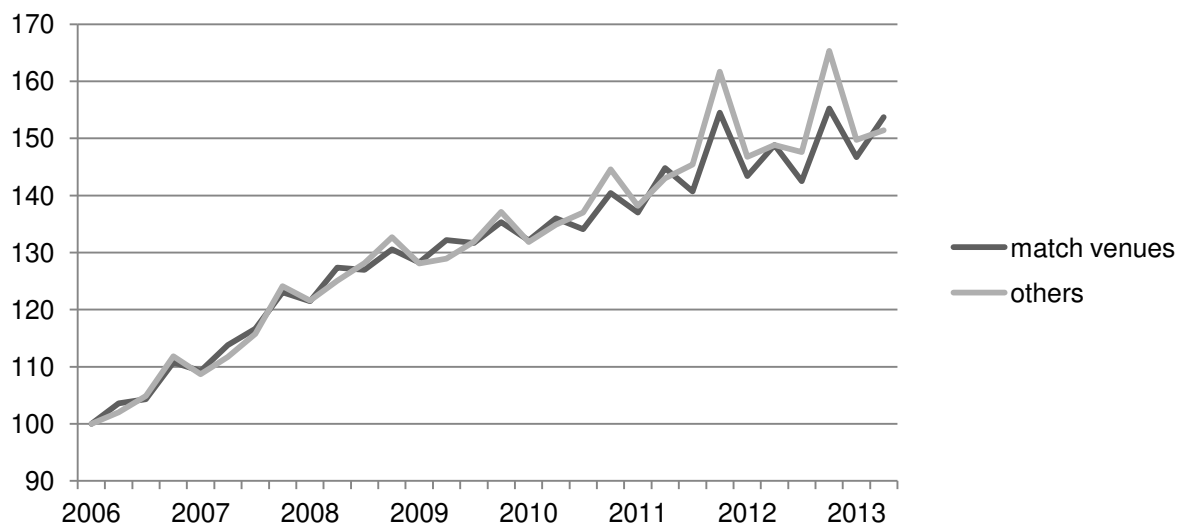


Figure 6.2. Comparison of the average wage in the private sector in Euro 2012 match venues and other voivodeships (the year 2006 = 100)

Source: Author's own compilation based on: Local Data Bank, Central Statistical Office, <http://www.stat.gov.pl>.

In the case of wages the differences between the match venues and others remain small in the entire period of the study. Strangely, beginning from 2010, with short breaks, there has been a visible increase in the average wages in the voivodeships that did not host Euro 2012. At the times of most striking contrast (4th quarter of 2012) the differences in favour of the others are ca. 10 percentage points.

We could therefore conclude on the basis of such simplified analysis that:

- 1) organisation of Euro 2012 contributed to an increase in employment in the voivodeships where the event was held,
- 2) organisation of Euro 2012 did not determine an increase in employees' wages in the voivodeships where the event was held.

In order to clarify the extent to which the differences in the development of employment and wages figures in the two comparative groups are significantly correlated with the occurrence of the UEFA Euro 2012, the above mentioned DD method was employed.

4. Application of the difference in difference model in the estimation of the impact of Euro 2012 on employment and wages

The impact of Euro 2012 on employment and wages was estimated using the model employed, amongst others, by Feddersen and Maenning [Feddersen,

Maennig, 2009, p. 2], commonly used in the determination of the relationship between mega sports events and the labour market.

It takes the following form:

$$\ln P_{i,t} = y_1 X_i + y_2 MVO_i + y_3 POST_t + y_4 MVO_i \cdot POST_t + y_5 trd + y_6 trd \cdot MVO_i + y_7 trd \cdot POST_t + y_8 trd \cdot POST_t \cdot MVO_i + \varepsilon_{i,t}$$

where:

- $\ln P_{i,t}$ – log employment or log average real wage per worker in voivodeship i in Poland in quarter t ,
- X_i – vector of covariates from each voivodeship (for the individual selected sectors of the economy),
- MVO_i – a variable describing permanent differences between the group investigated (match venues) and the control group (others),
- $POST_t$ – intervening variable for all voivodeships,
- trd – general time trend for all voivodeships,
- $\varepsilon_{i,t}$ – the disturbance variable.

Information concerning the vector of covariates X_i is verified for the period until 2010. The MVO_i variable assumes the value of 0 or 1. The value 0 is entered for voivodeships in which Euro 2012 matches were not played. The value 1 applies to the voivodeships that hosted the event. $POST_t$ is a statistic for the period following Euro 2012, assuming the value of 0 for the preparation and event phases and the value of 1 for the period following the tournament. Also, the period following the tournament is assumed to commence in the 3rd quarter of 2012. $MVO_i \cdot POST_t$ is a statistic for the match venues and the period following Euro 2012 (1 in the case of a match venue and the period following the UEFA Euro, otherwise 0). trd is a time trend starting with a value of 6 in the year 2006 and increasing by 0.25 each quarter. The variable $trd \cdot MVO_i$ isolates the difference in trend in the group of voivodships hosting the event for the entire period ($trd \cdot MVO_i = 0, 1, 2, \dots, 30$), while the variable $trd \cdot POST_t$ indicates trend changes in all voivodships resulting from Euro 2012, i.e. in the phase after the end of the event ($trd \cdot POST_t = 0, 1, \dots, 4$). Finally, the variable $trd \cdot POST_t \cdot MVO_i$ makes it possible to determine the trend differences for the group of host voivodships in the phase after the end of the tournament ($trd \cdot POST_t \cdot MVO_i = 0, 1, \dots, 4$).

A few highly interesting conclusions can be reached on the basis of the research results presented in Table 6.1. High values of R^2 and adjusted R^2

indicate a very good model fit to empirical data. In the case of employment the coefficient is very high – in excess of 85. This means that the model accounts for more than 85% of the variation in the status of employment in four Polish voivodeships in the period of seven and a half years. At the same time, the model accounts for exactly 72% of the wage changes.

In an overwhelming proportion of the cases, the individual dummies are characterised by statistical significance for 1%, 5% and 10% confidence levels. Only in two cases, i.e. $POST_t$ for real wages and $trd \cdot MVO_i$ for employment the results turned out to be of no statistical significance.

The following conclusions can be drawn on the basis of in-depth analysis of employment data:

- all four sectors of employment show positive values. In the case of construction the coefficient has the highest value of 2.54, which means that it was the sector where employment increased most significantly in the period investigated.
- the increase in employment was greater in the match venues than in others in the whole period of the study;
- the period after the end of the Championships is characterised by a fall in employment in all 16 voivodeships;
- nevertheless, in the phase after the end of Euro 2012 the employment level in the match venues remains 0.6% higher than in the others;
- analysis of statistically significant trend coefficients demonstrates their limited importance, as they do not differ significantly from zero.

As for real wages, the following comments may be ventured:

- there is a certain ambiguity as to the wage changes in the individual sectors (increase in construction, accommodation and food services; a decrease in trade and real estate services);
- there is a marked decrease in wages in the Euro 2012 host voivodships compared to the other voivodships in the entire period investigated;
- taking into consideration only the phase after the end of the event, there is a slight (0.8%) increase in the match venues compared to the others;
- trend analysis, as in the case of employment, indicates very limited significance of trends due to very low values, close to zero.

Table 6.1.

Results of DD model		
Dependent variable	Employment Coefficient Values (Standard Errors)	Real wages Coefficient Values (Standard Errors)
Constant	-0.3176** (0.6677)	1.1543*** (1.1223)
% construction	2.5416*** (0.8724)	0.4539*** (0.0445)
% trade	0.2229** (0.2666)	-0.8777** (0.779)
% accommodation and catering	0.5552*** (0.0676)	2.6719*** (0.0212)
% property market services	0.3352** (0.168)	-0.0433*** (0.7851)
MVO_i	0.2721* (0.0989)	-0.0211** (0.0566)
$POST_t$	-0.0543* (0.0812)	-0.0133 (0.0549)
$MVO_i \cdot POST_t$	0.006** (0.9888)	0.0081* (0.6778)
trd	0.0082** (0.0043)	0.0023* (0.0036)
$trd \cdot MVO_i$	-0.001 (0.0033)	-0.0054* (0.0111)
$trd \cdot POST_t$	0.0003** (0.0021)	0.0015** (0.001)
$trd \cdot POST_t \cdot MVO_i$	-0.0028* (0.0087)	-0.0021** (0.0043)
R ²	0.88	0.72
Adjusted R ²	0.86	0.72
F statistic	85.13	14.44

* significant on 10% confidence level,

** significant on 5% confidence level,

*** significant on 1% confidence level

Source: Author's own work.

Based of the above conclusions it is possible to affirm that the organisation of UEFA Euro 2012 had a significant influence on the labour market in the period between 2006 and the 2nd quarter of 2013. Employment in the host voivodeships was 26% higher than in other regions. However, the positive effect is much less visible after the end of the Championships (a mere 0.6% higher in the match venues than in the others), which indicates the limited character of

“legacy” in Polish host voivodeships. Moreover, the negative value of $trd \cdot POST_t \cdot MVO_i$ indicates only a very slight impact of Euro 2012 on the labour market in the future.

In the case of real wages we could even demonstrate a negative “Euro effect”. In the entire period of the study, the wage changes in the voivodships hosting Euro 2012 proved to be smaller by more than 2% than the wage changes in the other voivodships. This cannot be compensated by slightly greater wage changes in the match venues during the post-event phase (0.8%) in view of the negative trend $trd \cdot POST_t \cdot MVO_i$, which will eliminate this effect completely in ca. 15 quarters ($0.0081 / 0.0021 \cdot 0.25 \approx 15.43$).

5. Conclusions

In order to determine the relationship between the event and the employment and real wage levels, the popular difference-in-difference model was used. The applied model produced results corresponding to most results of similar studies conducted all over the world – it proved that there is no significant relationship between the organisation of an event and positive changes on the labour market following the event. Nevertheless, Euro 2012 contributed to a rise in employment in the preparation phase and during the event itself, though accompanied by a slight fall in real wages.

To sum up, in terms of measurable quantities, it is difficult to identify significant determinants confirming the beneficial effect of Euro 2012 on the economy in terms of employment market.

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